

Inv-2239

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
SPOKANE, PORTLAND & SEATTLE RAILWAY

MT. PLEASANT, WASH.

DECEMBER 26, 1937

INVESTIGATION NO. 2239

SUMMARY

Inv-2239

Railway:	Spokane, Portland & Seattle
Date:	December 26, 1937
Location:	Mt. Pleasant, Wash.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	275
Engine number:	G.N. 3127
Consist:	S.P.& S. 530 which was being towed, 41 loads, 9 empties, caboose
Speed:	30-40 m.p.h.
Track:	Straight; practically level
Weather:	Raining
Time:	9:30 p.m.
Casualties:	2 killed; 3 injured
Cause:	Striking a landslide

Inv-2239

February 1, 1938.

To the Commission:

On December 26, 1937, there was a derailment of a freight train on the Spokane, Portland & Seattle Railway near Mt. Pleasant, Wash., which resulted in the death of two employees and the injury of three employees. This accident was investigated in conjunction with the Department of Labor and Industries, State of Washington.

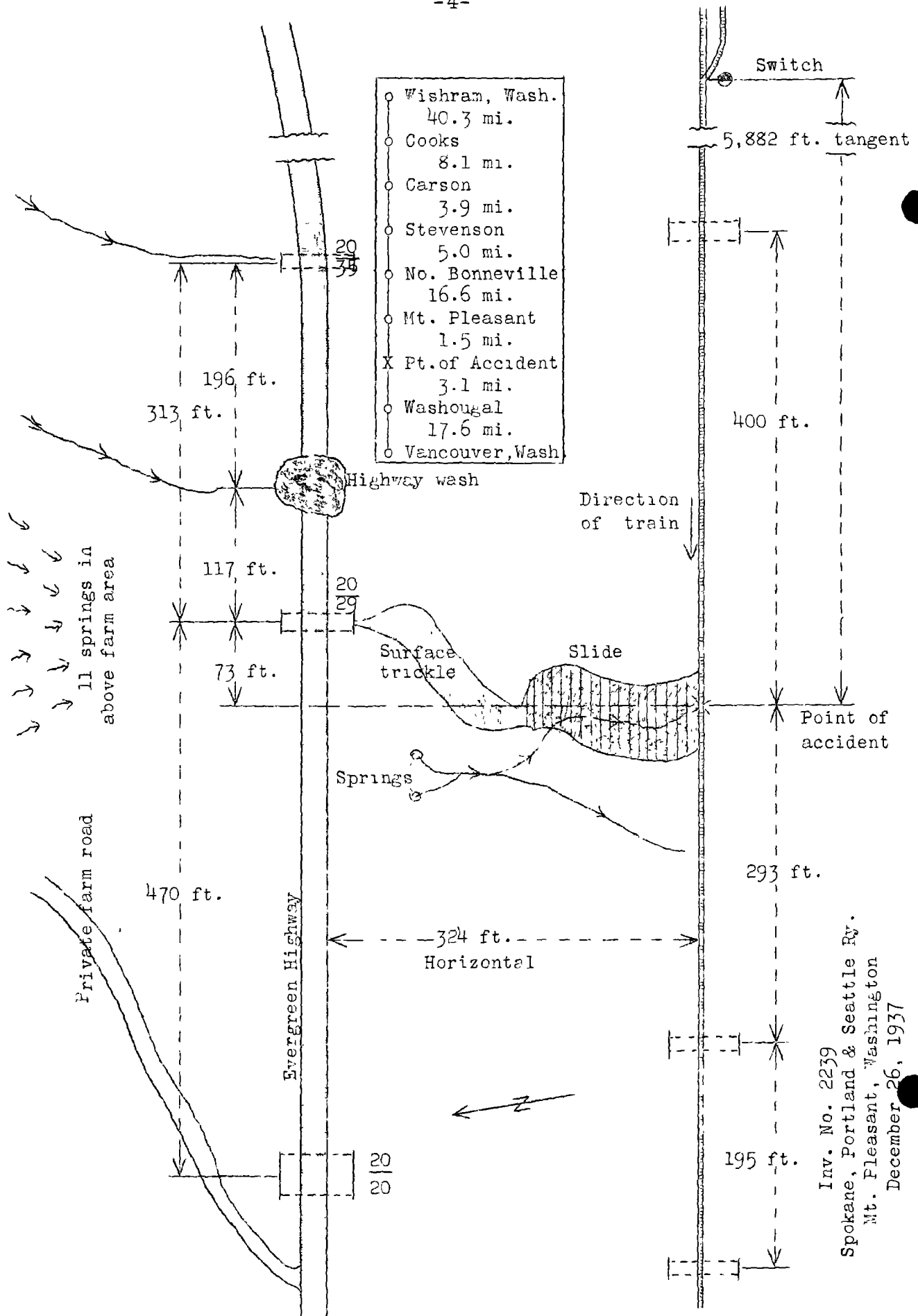
Location and method of operation

This accident occurred on the First Subdivision of the Vancouver Division, extending between Wishram and Vancouver, Wash., a distance of 96.1 miles; in the vicinity of the point of accident this is a single-track line over which trains are operated by timetable and train orders, no block-signal system being in use. The derailment occurred 5,882 feet west of the west switch of the siding at Mt. Pleasant; starting at that switch the track is tangent to the point of derailment and for 1,143 feet west thereof, while the grade is practically level.

The track is laid on the north bank of the Columbia River, and in this locality is on a side-hill cut; the main portion of the hill north of the tracks is about 1 mile in length and the hill slopes steeply upward for more than $\frac{1}{2}$ mile. A drainage ditch about 2 feet wide and 3 feet deep parallels the track on the north, and within 500 feet of the point of derailment three culverts under the track carry the water from the ditch to the descending slope south of the roadbed. Two culverts are west, and one is east of the point of accident; a culvert 488 feet west of this point is a 12-inch cast iron pipe 24 feet long; a culvert 293 feet west is a 24-inch cast iron pipe 60 feet long; a culvert 400 feet east of the point of accident is a 24-inch cast iron pipe 42 feet long.

The track is laid with 85-pound rail, 33 feet in length, on 18 treated ties to the rail length; it is single-spiked, has 8 rail anchors to the panel, is ballasted with gravel size talus to a depth of 12 inches, and is fairly well maintained.

State Highway #8, also known as Evergreen Highway, parallels the track on the north; it is 154 feet above, and 324 feet north of, the track. A drainage ditch runs along the north edge of the highway and water flowing in this ditch is diverted to the hillside slope between the highway and the railway by three culverts located within 470 feet of the point of accident, one to the west and two to the east. Culvert



Inv. No. 2239
Spokane, Portland & Seattle Ry.
Mt. Pleasant, Washington
December 26, 1937

20-20, located 397 feet west of the point of accident, has cross-sectional dimensions of 3 feet by 3 feet and is 58 feet long; culvert 20-29, also referred to as the dry culvert, located 73 feet east of the point of accident, is an 18-inch concrete pipe 42 feet long; culvert 20-35, located 386 feet east of the point of accident, is an 18-inch concrete pipe 52 feet long. At a point approximately 25 feet east of culvert 20-29 there is a drainage divide in the ditch so that normally only a very small portion of the water draining from the hillside north of the highway passes through this last-mentioned culvert.

North of the highway, on the upper portion of the hill, there is a farm known as the Duncan farm. In addition to water supplied by rainfall or other precipitation, 11 springs within the area of this farm drain toward the highway ditch and through its diverting culverts.

It had been raining hard for sometime prior to the derailment, which occurred about 9:30 p.m.

Description

No. 275, a west-bound freight train, consisted of S.P.&S. engine 530 which was being towed, 41 loaded cars, 9 empty cars and a caboose, hauled by G.N. engine 3127. It was in charge of Conductor Roberson and Engineman Larsen, and Engineman Raab was acting as engine-messenger on the engine in tow. This train passed North Bonneville, the last open office, at 9:03 p.m., 3 hours 10 minutes late, passed Mt. Pleasant, 13.7 miles beyond, and on reaching a point approximately 1.11 miles west of the west switch of the siding at that place was derailed due to striking a landslide while traveling at a speed estimated to have been between 30 and 40 miles per hour.

Both engines, their tenders, 15 loaded and 7 empty cars were derailed. The engines stopped on their left sides, down the embankment, with the front end of the lead engine, G.N. 3127, at a point 81 feet south of the track and 263 feet west of the slide; both engines were badly damaged. The derailed cars were piled up in a mass of wreckage within a space of about 160 feet, and caught fire; 20 of the derailed cars were listed to be destroyed. The employees killed were the fireman, of G.N. engine 3127, and the head brakeman, who was riding on the left side of S.P. & S. engine 530; the employees injured were both enginemen, and the swing brakeman.

Summary of evidence

Engineman Larsen, of engine 3127, stated that prior to departing from Wishram on this trip the air brakes were tested, and that they worked properly en route. It rained hard throughout the trip, harder at some places than others, but nothing unusual for this time of the year. While passing through Mt. Pleasant the speed was about 35 miles per hour. The cab window on the right side was open and there was a clear vision window at the side of the cab; there were no steam leaks to obstruct vision and the headlight was burning brightly, but owing to the fact that the focus of the headlight was low and the rain was heavy he could not see any great distance ahead. He was working a light throttle and although he was maintaining a lookout ahead through the storm window, he did not see any obstruction on the straight track. The first knowledge he had of anything wrong was when the engine, without any warning whatever, seemed to plunge downward, as though it had run off the ends of the rails. He had no chance to close the throttle or to apply the brakes, and after the engine stopped on its side he climbed out of the cab window above him. No previous trouble had been experienced at this location. En route he did not notice high water at any place to indicate possible danger ahead, nor did he receive any orders or instructions of any kind, either written or verbal, concerning track conditions in the vicinity of the point of accident; no slow flags were encountered along the right of way.

Engineman Raab, engine-messenger on the second engine, which was in tow but under steam, made a statement practically identical with that of Engineman Larsen of the lead engine as to weather conditions and the events of the trip. The head brakeman was on the left side of the second engine. Engineman Raab was working a very light throttle, just sufficient for lubrication; the air was cut^{out} on his engine and under control of the lead engineman. The side cab windows were open, but the front window was closed. At the time of the accident the train was traveling at a speed of about 30 to 33 miles per hour. No previous trouble had been experienced at this location.

Conductor Roberson, Swing Brakeman Wilson and Flagman Mills were on the caboose. Their statements were to the effect that it had rained continuously during the trip. West of North Bonneville there was heavy rainfall, but nothing to cause alarm or to indicate a dangerous condition. The speed was about 35 to 38 miles per hour and the accident occurred about 9:30 p.m. Brakeman Wilson stated that the density of rain was such that a slide was possible, but taking into consideration the fact that the railroad had been in operation for about 30 years it was logical to assume that the banks were well set.

Track Inspector Dunegan stated that he patrolled the track as usual on the day of the accident, and between 10:45 and 11 a.m. he passed the point where later the slide occurred. At that time there was no high water, nor any alarming or dangerous condition, or anything to cause concern. It had rained continuously throughout the day. Water was flowing freely in the track ditches, not exceptionally deep, and the ditches were open. The flow through the culverts was escaping, and the water was not backing up at any place. No condition existed that warranted the attention of the section foreman, nor was there any alarming condition on the bluff where the slide later occurred.

Section Foreman Cremedas, within whose territory the accident occurred, stated that it rained all day, but not enough to cause him any concern as to water conditions along the track on his section. He did not think it necessary to take any action under rule 980 which provides that track foreman shall, in case of extraordinary storms or high water, be out, day or night, with proper signals, watch places most liable to damage and take every precaution to prevent accident. During the 17 years he had been on this section there had never been any previous trouble at this location.

Section Foremen Gallas and Melonas, on adjoining sections, and Extra Gang Foreman Tachibana, made statements to the effect that in their opinion it did not rain hard enough on Sunday, December 26, to warrant sending out men or going out themselves to patrol the track in the vicinity of the slide area.

Roadmaster Corey stated that it was raining quite hard at Vancouver on the day of the accident, but not sufficiently to cause him any alarm about track conditions. He did not think there was anything unusual about existing weather conditions since the annual rainfall in this vicinity is about 60 inches. Except when heavy rains follow a heavy freeze, or when there was a run off of snow with the rain they have no trouble with slides, falling rocks, or water, and none of these conditions existed on December 26. The rain continued for three days after the derailment and no slides or rock trouble occurred anywhere else between Vancouver and Wishram, except at a blocked culvert near Home Valley. Seven regular track walkers patrol such areas as are not considered safe in ordinary winter weather, but the vicinity of the point of accident is not considered dangerous and he did not deem it necessary to call out additional men. He did not know of heavy rains ever having caused slides in this territory. He arrived at the scene of the accident about 12:30 a.m. At the west end of the wreckage he found a slide consisting of 75 or 80 yards of mud, gravel, small rock and brush, which extended about 50 feet along the track; the slide material over the north rail appeared to be

about 12 inches deep. On the following day he went up on the hill above the point where the slide occurred and looked over the territory in a general way. He found evidence that water flowing through a farm above the highway had been diverted by some one in such way as to increase the amount of water flowing through highway culvert 20-29 to such an extent as to cause the slide. This evidence consisted of freshly spaded ground in the orchard and a round pointed shovel leaning against an apple tree. There was a small wash of material on the highway east of the culvert 20-29 which ordinarily is a dry culvert, and as the material in this wash was sufficient to block the highway ditch, the water was forced to flow westward and through culvert 20-29 in such quantity as to cut a new channel direct to the point of derailment, whereas previously this water had been spread over the hillside. When the highway construction was in progress about 1926 he inspected the culverts being installed under the highway with relation to the effect they would have on the railway and at that time he considered that the drainage provided would not seriously interfere with drainage as it came down to the track. He thought there was sufficient drainage at the track to accommodate water coming off the side hill. Furthermore, on this hill there is no loose rock on the surface, and it is not a place water would ordinarily give trouble so far as rock is concerned.

Resident Engineer Thomas stated that he made a thorough check of the drainage conditions which caused the slide resulting in the derailment. A transit and wye level survey of the territory extending approximately 700 feet either side of the slide and for a distance of 1,500 feet back into the hills from the center line of the railway showed that approximately 1,500 feet from the track and directly north of the slide there are two distinct drainage areas, one to the east that contributed in no way to the volume of water that came down in the vicinity of the slide, and the other to the west that originated in territory involving 11 or more springs normally flowing almost directly west to a 3 foot by 3 foot box culvert under the highway which feeds to a 24-inch culvert under the railway track and to a 12-inch culvert under the track located farther west. These two culverts take care of the flow from the box culvert when the rain is excessive and there is considerable percolation from the side hill. Some distance above the highway a roadway through a farm provides a channel which handles overflow water and picks up some additional volume from side hill springs. This channel flows generally southeasterly to a point approximately 400 feet above the highway and just east of the slide on the track. The water from this channel would then continue down the roadway to the three culverts, which is the normal drainage. Through artificial diver-

sion, however, or from some other cause, the water from this channel was directed to a point approximately 330 feet from the highway, into open side hill country, and in flowing down this open side hill to the highway it cut a new channel. It was evident to him that the duration of the flow of water in this channel was not greater than 24 hours. This was evidenced by two facts, first the tendency of the channel to spread until it found a definite course, and second, the spew of gravel material on the highway that came out of the newly washed channel. The washing of this material upon the highway at a point 117 feet east of the slide blocked the highway ditch and reversed the flow of water so that it was diverted to culvert 20-29 which is located directly above the slide area. The slide proper on the track extended 133 feet up the hill; it was 45 or 50 feet wide at the track and narrowed to about 30 feet farther up the hill. At the top the average depth of the slide was 3 feet and in a few places a slight scour to 4 feet. The slide material consisted of natural ground with about 1 foot of loam and $2\frac{1}{2}$ feet of conglomerate, principally gravel intermixed with clay; this was superimposed on a clay shale soft rock that lay generally at an inclination of about $1\frac{3}{4}$ to 1. The water that came through the dry culvert percolating through the side hill and through the loam and gravel material, lubricated this solid plane and due to the weight of the superimposed material the slide resulted. The volume of the slide as determined by cross section in the field was 236 cubic yards; only a portion of that reached the track area proper, because on the northerly side of the railroad track there was an approximate distance of 12 feet of the side bank cut and ditch made during construction.

W. J. Duncan, farmer, stated that he has owned the farm property above the highway and north of the slide area for about 20 years. The stream of water that flows down the rut in his private road has been flowing through the same channel for about 19 years and no diversion had been made during that period. The shovel that was leaning against the tree in the orchard is used only to remove any debris that might come down and block the channel and had not been used for three weeks or longer; no new material had been spaded up to divert the flow of water. The wash that occurred on the north side of the highway and which blocked the highway drainage ditch prevented the water in that ditch from flowing normally eastward, causing it to flow westward and under the highway through the normally dry highway culvert above the slide on the railway track. He stated that the rainfall which was in progress at the time of the accident was the heaviest rainfall experienced at that place.

Assistant Chief Dispatcher Barlow stated that during his trick of duty from 3:45 p.m. to 11:45 p.m., December 26, he did not receive any alarming reports as to weather conditions or anything abnormal for this time of the year; it was raining hard, but not enough to cause concern or to warrant issuing any special train orders.

The last train to pass over the track involved prior to the accident was east-bound freight train Extra 503, which passed the point where the slide afterwards occurred about 7:35 p.m., or within 2 hours of the time of derailment. At the time that train passed it was sleeting and raining hard, but the engine crew did not notice any unusual or dangerous condition. Weather conditions were the same as they had been for several days previously. The engineman of that train had been in the service for 27 years and many times had seen just as much water during other days in previous winters as on this particular night.

Discussion

At the time of the derailment a heavy rain storm was in progress, and it had been raining hard for some time previously. No. 275 approached the point of accident at a speed of between 30 and 40 miles per hour, and although the headlight of the leading engine was burning brightly and the engineman was keeping a lookout ahead, rain so interfered with vision that the obstruction caused by the landslide was not noticed until it was struck by the engine. The landslide consisted of about 236 cubic yards of material; only a portion of this reached the track, but the north rail was covered to a depth of about 12 inches for a distance of 45 or 50 feet. The slide was composed of loam and gravel intermixed with clay. Before it became dislodged from its position on the hill side it had rested on a clay-shale soft rock bed that lay at an inclination, of about 30°.

In the vicinity of the point of accident the railroad has been at its present location, with the same drainage provisions, for about 30 years. The highway was laid in its present location, with its present drainage facilities, over 11 years ago. During all of this time no trouble arising from water conditions has been experienced. A track inspector patrols this territory daily and on the day of the accident he passed the point where the slide occurred between 10:45 and 11 a.m.; at that time there was no indication of anything wrong. Prior to the accident the last train to move over the track involved passed the point of derailment less than 2 hours before the accident occurred and at that time the crew of the train did not observe any unusual condition in that vicinity.

Heavy rains are not unusual in this area, and the officials of the railroad whose duty it is to supervise the patrolling of the track were not alarmed and did not consider that the rainfall was of sufficient volume to warrant augmenting the usual staff of patrolmen. However, the records of the Weather Bureau show that the rainfall at Portland, Oreg., 32 miles west of the scene of the accident, during the 22 hours preceding the occurrence of the slide was 3.38 inches, and press reports indicate that this was an unusually heavy precipitation. During this rainfall dirt was washed from the slope north of the highway into the highway ditch, and at a point 117 feet east of culvert 20-29 sufficient dirt accumulated to dam the ditch and reverse the flow of water, thus diverting it to culvert 20-29 which is located almost directly above the slide area. Because of the drainage divide located in the highway ditch about 25 feet east of culvert 20-29, the usual flow of water through that culvert is so slight that it has never cut a channel but has resulted in only a surface trickle. The damming of the highway ditch, however, directed a heavy stream of water upon this area and the slide was the result.

Conclusion

This accident was caused by a landslide.

Respectfully submitted,

W. J. PATTERSON,

Director.